Test Report

Product Name	Wireless 11g + Bluetooth Combo PCI Card
Model No.	MS-6852, PC54GBT

Applicant	MICRO-STAR INT'L Co., LTD
Address	No 69, Li-De st., Jung-He City, Taipei Hsien, Taiwan, R.O.C.

Date of Receipt	Jul. 28, 2004
Issued Date	Aug. 09, 2004
Report No.	048L022EI

The test results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

Test Report Certification

Issued Date : Aug. 09, 2004
Report No. : 048L022EI

Accredited by DNV, Nemko and NIST (NVLAP)

Product Name	Wireless 11g + Bluetooth Combo PCI Card
Applicant	MICRO-STAR INT'L Co., LTD
Address	No 69, Li-De st., Jung-He City, Taipei Hsien, Taiwan, R.O.C.
Manufacturer	MICRO-STAR INT'L Co., LTD
Model No.	MS-6852, PC54GBT
Rated Voltage	AC 230V/50Hz
Trade Name	MSI
Measurement Standard	ETSI EN 300 328:V1.4.1 (2003-04)
Measurement Procedure	ETSI EN 300 328:V1.4.1 (2003-04)
Test Result	Complied

The test results relate only to the samples tested.
The test report is under the previsions of Directive 1999/5/EC, Article 3.2.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

Documented By : Rita Huang
(Rita Huang)

Tested By : Jeff Wu
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Approved By : Gene Chang
(Gene Chang)

NVLAP Lab Code : 200347-0

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Attachment 1: EUT Test Photographs
Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Wireless 11g + Bluetooth Combo PCI Card
Trade Name	MSI
Model No.	MS-6852, PC54GBT
Working Voltage	DC 5V (Power by PC)
Frequency Range	2412-2472MHz
Channel Number	13
Data Speed	DSSS: 1, 2, 5.5, 11MHz
	OFDM: 6, 9, 12, 18, 24, 36, 48, 54MHz
Channel separation	5 MHz
Type of Modulation	DSSS / OFDM
Channel Control	Auto
Antenna Type	Connector (Reverse SMA)
Antenna Gain	SmartAnt, 3dBi (Wireless)
Antenna	1 Set Cable: 1.0m

Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2412 MHz	Channel 02:	2417 MHz	Channel 03:	2422 MHz	Channel 04:	2427 MHz
Channel 05:	2432 MHz	Channel 06:	2437 MHz	Channel 07:	2442 MHz	Channel 08:	2447 MHz
Channel 09:	2452 MHz	Channel 10:	2457 MHz	Channel 11:	2462 MHz	Channel 12:	2467 MHz
Channel 13:	2472 MHz						

Note:

1. Regards to the frequency band operations; two rate that were included the lowest and highest frequency of channel were selected to perform the test, then show on this report.
2. This device is a composite device in accordance with ETSI regulations. The EMC was measured and made a test report that the report number is 048L022E.
3. QuieTek has verified all construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

EMI Mode	Mode 1: Transmitter 11Mbps
	Mode 1: Transmitter 54Mbps
	Mode 2: Receiver 11Mbps
	Mode 2: Receiver 54Mbps

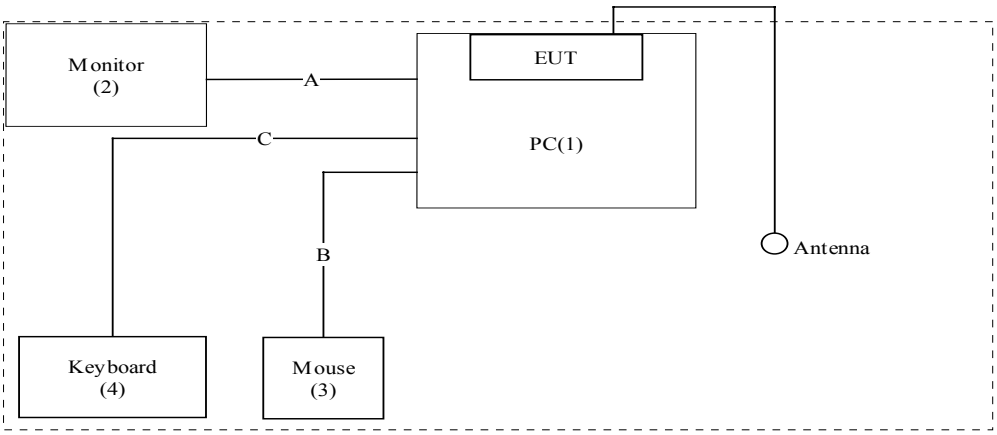
1.2. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
(1)	PC	MSI	N/A	N/A	N/A	N/A
(2)	Monitor	SAMSUNG	1200NF	800095K	DoC	Non-Shielded, 1.8m
(3)	Mouse	HITACHI	PC-KM1300	N/A	JNZ201213	N/A
(4)	Keyboard	COMPAQ	KB-0133	B55940FBUOE04B	DoC	N/A

Signal Cable Type		Signal Cable Description
A.	VGA Cable	Shielded, 1.8m, with two ferrite cores.
B.	Mouse Cable	Shielded, 1.8m
C.	Keyboard Cable	Shielded, 1.8m

1.3. Configuration of tested System



1.4. EUT Exercise Software

(1) Setup the EUT and simulators as shown on 1.3

(2) Turn on the power of all equipment.

(3) PC reads data from disk.

(4) Data will to coerce transmitting through EUT.

(5) Repeat the above procedure (3) to (4)

1.5. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	IEC 61000-4-2	15-35	20-35
Humidity (%RH)		30-60	50-55
Barometric pressure (mbar)		860-1060	950-1000
Temperature (°C)	IEC 61000-4-5	15-35	20-35
Humidity (%RH)		10-75	50-65
Barometric pressure (mbar)		860-1060	950-1000
Temperature (°C)	IEC 61000-4-4 IEC 61000-4-11	15-35	20-35
Barometric pressure (mbar)		860-1060	950-1000

Site Description:

July 03, 2002 Accreditation on NVLAP
NVLAP Lab Code: 200533-0
June 11, 2001 Accreditation on DNV
Statement No. : 413-99-LAB11

April 18, 2001 Accreditation on Nemko
Certificate No.: ELA 165
Certificate No.: ELA 162
Certificate No.: ELA 191

Site Name: Quietek Corporation
Site Address: No. 5, Ruei-Shu Valley, Ruei-Ping Tsuen,
Lin-Kou Shiang, Taipei,
Taiwa, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

2. Effective radiated Power

2.1. Test Equipment

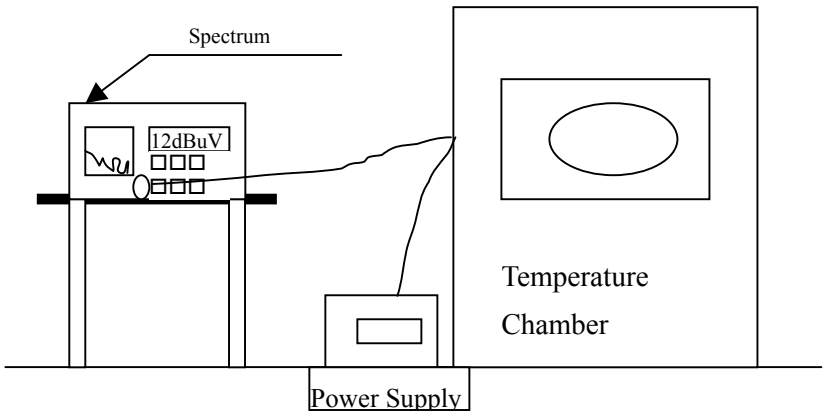
The following test equipments are used during the radiated emission tests:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.	Remark
Spectrum Analyzer	Advantest	R3162C / 71720140	May, 2004	
Temperature Chamber	TDE	CHM 150CT	Mar., 2004	

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.

2.2. Test Setup

Conduction Power Measurement



2.3. Test Condition

Standard Temperature and Humidity, Standard Test Voltage

2.4. Limits

The effective radiated power is defined as the total power of the transmitter.
The effective radiated power shall be equal to or less than -10 dBW (100 mW) e.i.r.p. This limit shall apply for any combination of power level and intended antenna assembly.

2.5. Test Procedure

The following method of measurement shall apply to both conducted and radiated measurements.
The measurement shall be performed using normal operation of the equipment with modulation, using the test data sequence, applied. Using a suitable means, the output of the transmitter shall be coupled to a diode detector; the output of the diode detector shall be connected to the vertical channel of an oscilloscope; the combination of the diode detector and the oscilloscope shall be capable of faithfully reproducing the envelope peaks and the duty cycle of the transmitter output signal.
The measurement shall be repeated at the lowest, the middle, and highest frequency of the stated frequency range.
FHSS equipment shall be made to hop continuously to each of these three frequencies separately.

2.6. Uncertainty

The measurement uncertainty is defined as ± 1.27dB

2.7. Test Specification

According to ETSI EN 300 328:V1.4.1 (2003-04)

2.8. Test Result

The emission from the EUT was below the specified limits. The worst-case emissions are shown in section 8. The acceptance criterion was met and the EUT passed the test.

3. Peak Power Density

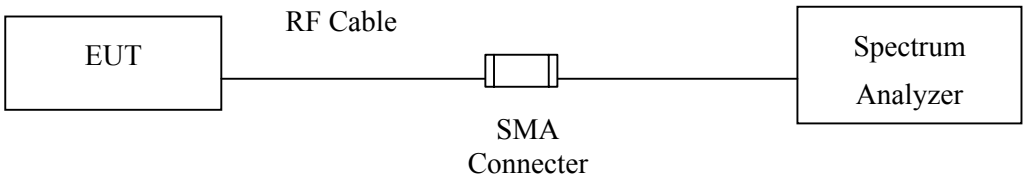
3.1. Test Equipment

The following test equipments are used during the radiated emission tests:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.	Remark
Spectrum Analyzer	Advantest	R3162C / 71720140	May, 2004	

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.

3.2. Test Setup



3.3. Test Condition

Standard Temperature and Humidity, Standard Test Voltage

3.4. Limits

The maximum spectral power density is defined as the highest level of power in Watts per Hertz generated by the transmitter within the power envelope.
For equipment using FHSS modulation, the maximum spectral power density shall be limited to -10 dBW (100 mW) per 100 kHz e.i.r.p. For equipment using other types of modulation, the maximum spectral power density shall be limited to-20 dBW(10 mW) per MHz e.i.r.p.

3.5. Test Procedure

The maximum spectral power density shall be determined using a spectrum analyzer of adequate bandwidth for the type of modulation being used in combination with an RF power meter.
Connect an RF power meter to the IF output of the spectrum analyzer and correct its reading using a known reference source, e.g. a signal generator.
The above procedure shall be repeated for each of the three frequencies identified by the procedure given in limit (subclause 5.7.2.2.)
Where the spectrum analyzer bandwidth is non-Gaussian, a suitable correction factor shall be determined and applied.
Where a spectrum analyzer is equipped with a facility to measure power density, this facility may be used instead of the above procedure.

3.6. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

3.7. Test Specification

According to ETSI EN 300 328:V1.4.1 (2003-04)

3.8. Test Result

The emission from the EUT was below the specified limits. The worst-case emissions are shown in section 8. The acceptance criterion was met and the EUT passed the test.

4. Frequency Range

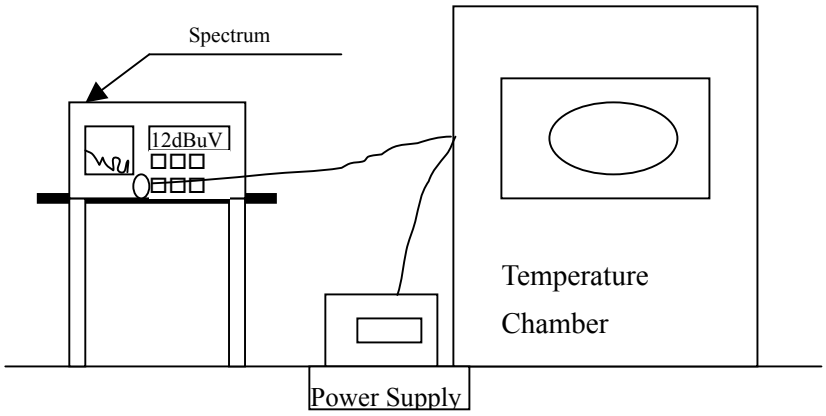
4.1. Test Equipment

Equipment	Manufacturer	Model No./Serial No.	Last Cal.	Remark
Spectrum Analyzer	Advantest	R3162C / 71720140	May, 2004	
Temperature Chamber	TDE	CHM 150CT	Mar., 2004	

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.

4.2. Test Setup

Conduction Power Measurement



4.3. Test Condition

Standard Temperature and Humidity, Standard Test Voltage

4.4. Limits

The frequency range of the equipment is determined by the lowest and highest frequencies occupied by the power envelope.

f_H is the highest frequency of the power envelope: it is the frequency furthest above the frequency of maximum power where the output power drops below the level of -80 dBm/Hz e.i.r.p. spectral power density (-30 dBm if measured in a100 kHz bandwidth).

f_L is the lowest frequency of the power envelope; it is the frequency furthest below the frequency of maximum power where the output power drops below the level equivalent to -80 dBm/Hz e.i.r.p. spectral power density (or -30 dBm if measured in a 100 kHz bandwidth).

For a given operating frequency, the width of the power envelope is (f_H – $f_{L)}$. In equipment that allows adjustment or selection of difference operation frequencies, the power envelope takes up difference positions in the allowed band. The frequency range is determined by the lowest value of f_L and the highest value of f_H resulting from the adjustment of the equipment to the lowest and highest operating frequencies.

For all equipment the frequency range shall lie within the band 2.4GHz to 2.4835GHz (f_L > 2.4GHz and f_H < 2.4835GHz).

4.5. Test Procedure

The measurement procedure shall be as follows:

a) Place the spectrum analyzer in video averaging mode with a minimum of 50 sweeps selected and activate the transmitter with modulation applied. The RF emission of the equipment shall be displayed on the spectrum analyzer;

b) Select lowest operating frequency of the equipment under test;

c) Using the marker of the spectrum analyzer, find lowest frequency below the operating frequency at which spectral power density drops below the level given in limit (subclause 5.2.3);

d) Select the highest operating frequency of the equipment under test;

e) Find the highest frequency at which the spectral power density drops below the value given in limit (subclause 5.2.3.);

f) The difference between the frequencies measured in steps c) and e) is the frequency range.

4.6. Uncertainty

The measurement uncertainty is defined as ± 100 kHz

4.7. Test Specification

According to ETSI EN 300 328:V1.4.1 (2003-04)

4.8. Test Result

The emission from the EUT was below the specified limits. The worst-case emissions are shown in section 8. The acceptance criterion was met and the EUT passed the test.

5. Spurious Emission

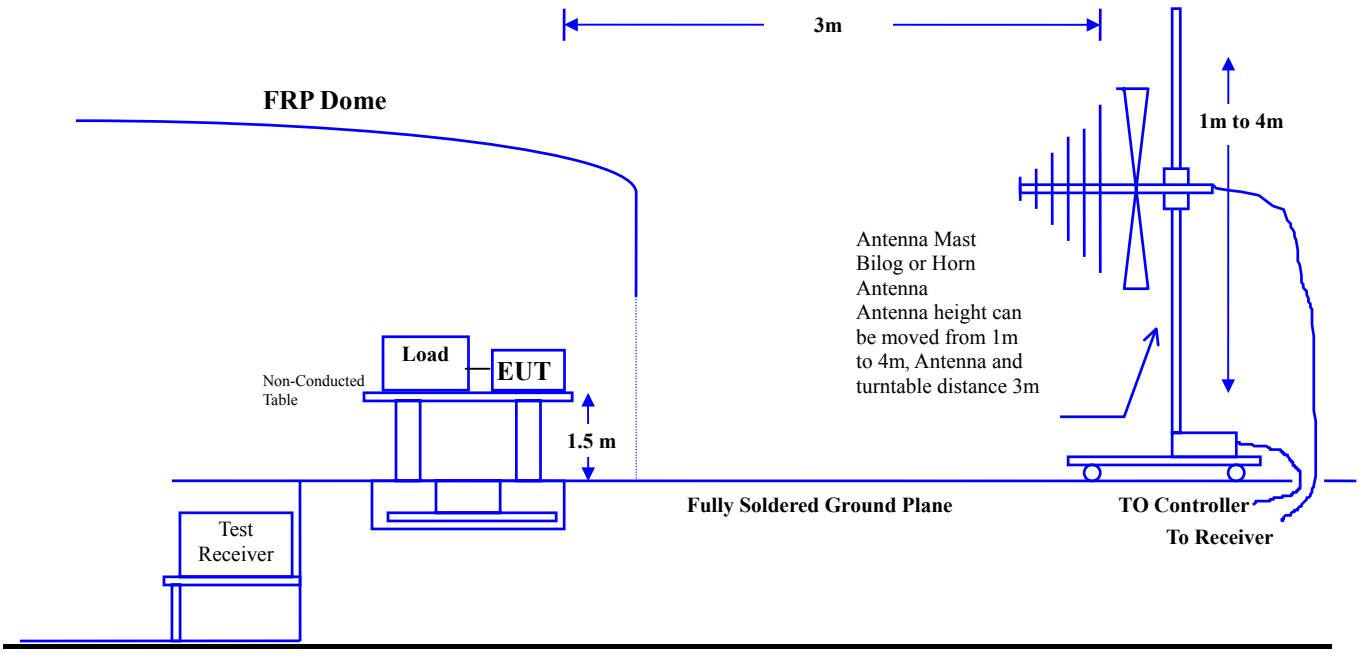
5.1. Test Equipment

The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☐Site # 1	Test Receiver	R & S	ESVS 10 / 834468/003	July, 2004
	Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2004
	Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2004
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Nov., 2003
☐Site # 2	Test Receiver	R & S	ESCS 30 / 836858 / 022	Nov., 2003
	Spectrum Analyzer	Advantest	R3162 / 100803466	May, 2004
	Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2004
	Bilog Antenna	SCHAFFNER	CBL6112B / 2705	Oct., 2003
	Horn Antenna	ETS	3115 / 0005-6160	July, 2004
	Pre-Amplifier	QTK	QTK-AMP-01/ 0001	July, 2004
☒Site # 3	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2004
	Spectrum Analyzer	Advantest	R3162 / 100803480	May, 2004
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2004
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2004
	Horn Antenna	ETS	3115 / 0005-6160	July, 2004
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2004

Note: 1. All equipments that need to calibrate are with calibration perio d of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

5.2. Test Setup



5.3. Test Condition

Standard Temperature and Humidity, Standard Test Voltage

5.4. Limits

Transmitter limits for narrowband spurious emission

Frequency Range	Limit when operating	Limit when in standby
30MHzto 1 GHz	-36 dBm	-57 dBm
Above 1 GHz to 12.75 GHz	-30 dBm	-47 dBm
1.8 GHz to 1.9 GHz 5.15 GHz to 5.3 GHz	-47 dBm	-47 dBm

Transmitter limits for wideband spurious emission

Frequency Range	Limit when operating	Limit when in standby
30MHzto 1 GHz	-86 dBm/Hz	-107 dBm/Hz
Above 1 GHz to 12.75 GHz	-80 dBm/Hz	-97 dBm/Hz
1.8 GHz to 1.9 GHz 5.15 GHz to 5.3 GHz	-97 dBm/Hz	-97 dBm/Hz

Narrowband spurious emission limit for receivers

Frequency Range	Limit
30MHzto 1 GHz	-57 dBm
Above 1 GHz to 12.75 GHz	-47 dBm

Wideband spurious emission limit for receivers

Frequency Range	Limit
30MHzto 1 GHz	-107 dBm/Hz
Above 1 GHz to 12.75 GHz	-97 dBm/Hz

5.5. Test Procedure

The EUT and its simulators are placed on a turn table which is 1.5 meters above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.
Broadband antenna (calibrated bi-log and horn antenna) are used as a receiving antenna.
Both horizontal and vertical polarization of the antenna are set on measurement. And a high frequency preamlifier were used increase the sensitivity of the measuring. In order to find the maximum emission, all of the interface cables must be manipulated according to ETSI EN 300 328:V1.4.1 (2003-04) on radiated measurement.
The additional notch filter below 1GHz was used to measure the level of harmonics radiated emission during field dtrength of harmonics measurement. The bandwidth setting on the field strength meter (R & S Spectrum Analyzer FSP40)is 100 kHz. The frequency range from 30MHz to 12.75GHz is checked.

5.6. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB
under 1G is defined as ± 3.8 dB

5.7. Test Specification

According to ETSI EN 300 328:V1.4.1 (2003-04)

5.8. Test Result

The emission from the EUT was below the specified limits. The worst-case emissions are shown in section 8. The acceptance criterion was met and the EUT passed the test.

6. Measurement Uncertainty Values

The maximum values of the absolute measurement uncertainties of the measurements defined in the present document shall not exceed the values given below:

Parameter	Uncertainty
radio frequency	± 1 x10 $^{-5}$
total RF power, conducted	± 1.5 dB
RF power density, conducted	± 3 dB
spurious emissions, conducted	± 3 dB
all emissions, radiated	± 6 dB
Temperature	± 1^{o}C
Humidity	± 5 %
DC and low frequency voltages	± 3 %

7. EMC Reduction Method During Compliance Testing

No modification was made during testing.

8. Test Result

The test results in the emission and the immunity were performed according to the requirements of measurement standard and process. Quietek Corporation is assumed full responsibility for the accuracy and completeness of these measurements. The test data of the emission is listed as below.
All the tests were carried out with the EUT in normal operation, which was defined as:

EMI Mode	Mode 1: Transmitter 11Mbps
	Mode 1: Transmitter 54Mbps
	Mode 2: Receiver 11Mbps
	Mode 2: Receiver 54Mbps

8.1. Test Data of Effective Radiated Power

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Effective Radiated Power
Test Mode : Mode 1: Transmitter 11Mbps

Antenna Gain: 3 dBi, Cable Loss: 1 dB, Duty Cycle: 1						
Test Conditions		Channel	Freq. (MHz)	Reading Level (dBm)	Emission Level (dBm)	Limit (dBm)
Tnom (25) °C	Vnom (230) V	1	2412	11.57	15.57	20
		7	2442	10.55	14.55	20
		13	2472	10.82	14.82	20
Tmax (35) °C	Vmax (253) V	1	2412	10.56	14.56	20
		7	2442	9.95	13.95	20
		13	2472	9.89	13.89	20
Tmax (35) °C	Vmin (207) V	1	2412	10.63	14.63	20
		7	2442	9.91	13.91	20
		13	2472	9.93	13.93	20
Tmin (0) °C	Vmax (253) V	1	2412	12.37	16.37	20
		7	2442	11.96	15.96	20
		13	2472	12.76	16.76	20
Tmin (0) °C	Vmin (207) V	1	2412	12.33	16.33	20
		7	2442	12.02	16.02	20
		13	2472	12.71	16.71	20

* Emission Level = Reading Level + Antenna Gain + 10 log (1/Duty Cycle)

Remark:

Channel 1 Lowest frequency at the appropriate spurious emission level
Channel 7 Middle frequency at the appropriate spurious emission level
Channel 13 Highest frequency at the appropriate spurious emission level

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Effective Radiated Power
Test Mode : Mode 1: Transmitter 54Mbps

Antenna Gain: 3 dBi, Cable Loss: 1 dB, Duty Cycle: 1						
Test Conditions		Channel	Freq. (MHz)	Reading Level (dBm)	Emission Level (dBm)	Limit (dBm)
Tnom (25) °C	Vnom (230) V	1	2412	12.88	16.88	20
		7	2442	14.22	18.22	20
		13	2472	14.11	18.11	20
Tmax (35) °C	Vmax (253) V	1	2412	13.10	17.10	20
		7	2442	12.91	16.91	20
		13	2472	13.29	17.29	20
Tmax (35) °C	Vmin (207) V	1	2412	13.08	17.08	20
		7	2442	12.96	16.96	20
		13	2472	13.26	17.26	20
Tmin (0) °C	Vmax (253) V	1	2412	14.01	18.01	20
		7	2442	15.69	19.69	20
		13	2472	15.51	19.51	20
Tmin (0) °C	Vmin (207) V	1	2412	13.99	17.99	20
		7	2442	14.99	18.99	20
		13	2472	15.53	19.53	20

* Emission Level = Reading Level + Antenna Gain + 10 log (1/Duty Cycle)

Remark:

Channel 1 Lowest frequency at the appropriate spurious emission level
Channel 7 Middle frequency at the appropriate spurious emission level
Channel 13 Highest frequency at the appropriate spurious emission level

8.2. Test Data of Peak Power Density

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Peak Power Density
Test Mode : Mode 1: Transmitter 11Mbps

Channel	Freq. (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm/MHz)
Transmit speed: 11 Mbps, Antenna Gain: 3dBi, Cable Loss: 0.5 dB				
1	2412	5.13	8.63	10
7	2442	4.25	7.75	10
13	2472	4.62	8.12	10

* Measure Level = Reading Level + Antenna Gain + 10 log (1/Duty Cycle)

Test Result	PASS

Remark:

Channel 1 Lowest frequency at the appropriate spurious emission level
Channel 7 Middle frequency at the appropriate spurious emission level
Channel 13 Highest frequency at the appropriate spurious emission level

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Peak Power Density
Test Mode : Mode 1: Transmitter 54Mbps

Channel	Freq. (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm/MHz)
Transmit speed: 54 Mbps, Antenna Gain: 3dBi, Cable Loss: 0.5 dB				
1	2412	-0.28	3.22	10
7	2442	-0.37	3.13	10
13	2472	-0.31	3.19	10

* Measure Level = Reading Level + Antenna Gain + 10 log (1/Duty Cycle)

Test Result	PASS

Remark:

Channel 1 Lowest frequency at the appropriate spurious emission level
Channel 7 Middle frequency at the appropriate spurious emission level
Channel 13 Highest frequency at the appropriate spurious emission level

8.3. Test Data of Frequency Range

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Frequency Range
Test Mode : Mode 1: Transmitter 11Mbps

Test Conditions		Frequency (MHz)	
Tnom (25) °C	Vnom (230) V	F_L	2403.55
		F_H	2480.55
Tmax (35) °C	Vmax (253) V	F_L	2403.60
		F_H	2480.35
Tmax (35) °C	Vmin (207) V	F_L	2403.60
		F_H	2480.35
Tmin (0) °C	Vmax (253) V	F_L	2403.55
		F_H	2480.90
Tmin (0) °C	Vmin (207) V	F_L	2403.55
		F_H	2480.90

Test Result	F_L: 2403.55 MHz F_H: 2480.90 MHz

Remark:

F_L Lowest frequency at the appropriate spurious emission level

F_H Highest frequency at the appropriate spurious emission level

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Frequency Range
Test Mode : Mode 1: Transmitter 54Mbps

Test Conditions		Frequency (MHz)	
Tnom (25) °C	Vnom (230) V	F_L	2403.60
		F_H	2480.40
Tmax (35) °C	Vmax (253) V	F_L	2403.60
		F_H	2480.35
Tmax (35) °C	Vmin (207) V	F_L	2403.60
		F_H	2480.35
Tmin (0) °C	Vmax (253) V	F_L	2403.55
		F_H	2480.55
Tmin (0) °C	Vmin (207) V	F_L	2403.55
		F_H	2480.55

Test Result	F_L: 2403.60MHz F_H: 2480.55MHz

Remark:

F_L Lowest frequency at the appropriate spurious emission level

F_H Highest frequency at the appropriate spurious emission level

8.4. Test Data of Spurious Emission

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Spurious Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter 11Mbps (Channel 1)

Frequency (MHz)	Measurement (dBm)	Reading (dBm)	Correction Factor (dB)	Limit (dBm)	Margin (dB)
Peak Detector **(Horizontal)**					
399.570	-61.85	-61.08	-0.77	-36.00	25.85
485.900	-65.93	-64.71	-1.22	-36.00	29.93
599.390	-62.61	-60.81	-1.80	-36.00	26.61
669.230	-62.36	-60.20	-2.16	-36.00	26.36
799.210	-65.32	-62.49	-2.83	-36.00	29.32
933.070	-66.16	-62.64	-3.52	-36.00	30.16
4824.000	-60.90	-69.37	8.47	-30.00	30.90
7236.000	-53.98	-60.05	6.07	-30.00	23.98
9648.000	-51.72	-56.72	5.00	-30.00	21.72
12060.000	-48.47	-53.27	4.80	-30.00	18.47
Peak Detector **(Vertical)**					
97.900	-67.97	-68.75	0.78	-36.00	31.97
399.570	-69.48	-68.71	-0.77	-36.00	33.48
499.480	-70.49	-69.20	-1.29	-36.00	34.49
535.370	-70.65	-69.18	-1.47	-36.00	34.65
669.230	-64.95	-62.79	-2.16	-36.00	28.95
800.180	-71.95	-69.12	-2.83	-36.00	35.95
4824.000	-60.86	-69.33	8.47	-30.00	30.86
7236.000	-54.83	-60.90	6.07	-30.00	24.83
9648.000	-51.28	-56.28	5.00	-30.00	21.28
12060.000	-48.52	-53.32	4.80	-30.00	18.52

Note:

1. All Reading are peak value.
2. “ ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Correction Factor

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Spurious Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter 11Mbps (Channel 13)

Frequency (MHz)	Measurement (dBm)	Reading (dBm)	Correction Factor (dB)	Limit (dBm)	Margin (dB)
Peak Detector **(Horizontal)**					
400.100	-61.95	-61.17	-0.78	-36.00	25.95
485.950	-66.45	-65.20	-1.25	-36.00	30.45
599.530	-62.11	-60.21	-1.90	-36.00	26.11
669.740	-63.12	-60.90	-2.22	-36.00	27.12
800.130	-65.13	-62.28	-2.85	-36.00	29.13
935.110	-64.71	-61.16	-3.55	-36.00	28.71
4944.000	-59.99	-68.37	8.38	-30.00	29.99
7416.000	-55.51	-61.28	5.77	-30.00	25.51
9888.000	-50.88	-55.84	4.96	-30.00	20.88
12360.000	-48.86	-53.60	4.74	-30.00	18.86
Peak Detector **(Vertical)**					
97.950	-67.85	-67.53	-0.32	-36.00	31.85
400.330	-69.34	-68.46	-0.88	-36.00	33.34
500.530	-70.08	-68.58	-1.50	-36.00	34.08
536.330	-70.25	-68.74	-1.51	-36.00	34.25
670.550	-64.69	-62.46	-2.23	-36.00	28.69
803.210	-71.90	-69.01	-2.89	-36.00	35.90
4944.000	-60.63	-69.01	8.38	-30.00	30.63
7416.000	-55.40	-61.17	5.77	-30.00	25.40
9888.000	-51.32	-56.28	4.96	-30.00	21.32
12360.000	-48.53	-53.27	4.74	-30.00	18.53

Note:
1. All Reading are peak value.
2. “ ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Correction Factor

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Spurious Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter 54Mbps (Channel 1)

Frequency (MHz)	Measurement (dBm)	Reading (dBm)	Correction Factor (dB)	Limit (dBm)	Margin (dB)
Peak Detector **(Horizontal)**					
400.515	-61.82	-60.95	-0.87	-36.00	25.82
486.134	-65.86	-64.60	-1.26	-36.00	29.86
599.848	-62.58	-60.73	-1.85	-36.00	26.58
670.173	-62.28	-60.06	-2.22	-36.00	26.28
800.098	-65.29	-62.42	-2.87	-36.00	29.29
934.037	-66.12	-62.52	-3.60	-36.00	30.12
4824.000	-60.61	-69.08	8.47	-30.00	30.61
7236.000	-54.40	-60.47	6.07	-30.00	24.40
9648.000	-51.03	-56.03	5.00	-30.00	21.03
12060.000	-47.73	-52.53	4.80	-30.00	17.73
Peak Detector **(Vertical)**					
98.437	-67.93	-68.68	0.75	-36.00	31.93
399.644	-69.39	-68.57	-0.83	-36.00	33.39
500.447	-70.45	-69.14	-1.31	-36.00	34.45
535.828	-70.57	-69.03	-1.54	-36.00	34.57
670.102	-64.90	-62.65	-2.25	-36.00	28.90
800.554	-71.86	-68.95	-2.91	-36.00	35.86
4824.000	-59.74	-68.21	8.47	-30.00	29.74
7236.000	-54.80	-60.87	6.07	-30.00	24.80
9648.000	-51.44	-56.44	5.00	-30.00	21.44
12060.000	-48.47	-53.27	4.80	-30.00	18.47

Note:

1. All Reading are peak value.
2. “ ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Correction Factor

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Spurious Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter 54Mbps (Channel 13)

Frequency (MHz)	Measurement (dBm)	Reading (dBm)	Correction Factor (dB)	Limit (dBm)	Margin (dB)
Peak Detector **(Horizontal)**					
400.264	-61.78	-61.01	-0.77	-36.00	25.78
486.677	-65.89	-64.59	-1.30	-36.00	29.89
599.565	-62.54	-60.70	-1.84	-36.00	26.54
669.886	-62.35	-60.11	-2.24	-36.00	26.35
800.202	-65.25	-62.41	-2.84	-36.00	29.25
934.062	-66.13	-62.58	-3.55	-36.00	30.13
4944.000	-59.99	-68.38	8.39	-30.00	29.99
7416.000	-55.64	-61.41	5.77	-30.00	25.64
9888.000	-51.11	-56.07	4.96	-30.00	21.11
12360.000	-49.19	-53.93	4.74	-30.00	19.19
Peak Detector **(Vertical)**					
98.247	-67.94	-68.71	0.77	-36.00	31.94
400.550	-69.47	-68.64	-0.84	-36.00	33.47
500.135	-70.46	-69.13	-1.33	-36.00	34.46
535.505	-70.61	-69.06	-1.55	-36.00	34.61
670.089	-64.95	-62.75	-2.20	-36.00	28.95
800.686	-71.88	-69.04	-2.83	-36.00	35.88
4944.000	-60.54	-68.93	8.39	-30.00	30.54
7416.000	-56.06	-61.83	5.77	-30.00	26.06
9888.000	-50.44	-55.40	4.96	-30.00	20.44
12360.000	-47.80	-52.54	4.74	-30.00	17.80

Note:
1. All Reading are peak value.
2. “ ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Correction Factor

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Spurious Emission
Test Site : No.3 OATS
Test Mode : Mode 2: Receiver 11Mbps (Channel 1)

Frequency (MHz)	Measurement (dBm)	Reading (dBm)	Correction Factor (dB)	Limit (dBm)	Margin (dB)
Peak Detector **(Horizontal)**					
400.354	-61.83	-60.96	-0.87	-57.00	4.83
486.238	-65.92	-64.66	-1.26	-57.00	8.92
599.431	-62.60	-60.75	-1.85	-57.00	5.60
670.186	-62.27	-60.03	-2.24	-57.00	5.27
800.037	-65.26	-62.33	-2.92	-57.00	8.26
933.134	-66.11	-62.58	-3.53	-57.00	9.11
2038.000	-66.14	-73.90	7.76	-47.00	19.14
4076.000	-57.97	-66.76	8.79	-47.00	10.97
6114.000	-57.93	-65.95	8.02	-47.00	10.93
8152.000	-54.09	-59.24	5.15	-47.00	7.09
10190.000	-52.89	-57.67	4.78	-47.00	5.89
12228.000	-51.70	-56.71	5.01	-47.00	4.70
Peak Detector **(Vertical)**					
98.296	-67.95	-68.73	0.78	-57.00	10.95
400.277	-69.47	-68.63	-0.84	-57.00	12.47
500.139	-70.45	-69.13	-1.32	-57.00	13.45
535.759	-70.63	-69.06	-1.57	-57.00	13.63
669.752	-64.87	-62.68	-2.19	-57.00	7.87
801.009	-71.92	-69.09	-2.83	-57.00	14.92
2038.000	-66.16	-73.92	7.76	-47.00	19.16
4076.000	-53.24	-62.03	8.79	-47.00	6.24
6114.000	-58.55	-66.57	8.02	-47.00	11.55
8152.000	-53.40	-58.55	5.15	-47.00	6.40
10190.000	-53.00	-57.78	4.78	-47.00	6.00
12228.000	-51.70	-56.71	5.01	-47.00	4.70

Note:

1. All Reading are peak value.
2. “ ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Correction Factor

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Spurious Emission
Test Site : No.3 OATS
Test Mode : Mode 2: Receiver 11Mbps (Channel 13)

Frequency (MHz)	Measurement (dBm)	Reading (dBm)	Correction Factor (dB)	Limit (dBm)	Margin (dB)
Peak Detector **(Horizontal)**					
399.878	-61.81	-61.01	-0.80	-57.00	4.81
486.854	-65.88	-64.59	-1.28	-57.00	8.88
599.554	-62.57	-60.77	-1.80	-57.00	5.57
669.617	-62.30	-60.04	-2.25	-57.00	5.30
800.004	-65.23	-62.38	-2.85	-57.00	8.23
933.869	-66.11	-62.57	-3.54	-57.00	9.11
2098.000	-66.45	-74.17	7.72	-47.00	19.45
4196.000	-59.72	-68.44	8.72	-47.00	12.72
6294.000	-58.26	-65.87	7.61	-47.00	11.26
8392.000	-53.29	-58.50	5.21	-47.00	6.29
10490.000	-53.09	-57.70	4.61	-47.00	6.09
12588.000	-51.47	-56.44	4.97	-47.00	4.47
Peak Detector **(Vertical)**					
98.794	-67.89	-68.67	0.78	-57.00	10.89
400.037	-69.40	-68.54	-0.86	-57.00	12.40
500.211	-70.46	-69.07	-1.38	-57.00	13.46
535.803	-70.64	-69.11	-1.53	-57.00	13.64
669.323	-64.87	-62.68	-2.19	-57.00	7.87
800.907	-71.90	-69.04	-2.85	-57.00	14.90
2098.000	-65.86	-73.58	7.72	-47.00	18.86
4196.000	-55.83	-64.55	8.72	-47.00	8.83
6294.000	-58.02	-65.63	7.61	-47.00	11.02
8392.000	-53.72	-58.93	5.21	-47.00	6.72
10490.000	-52.76	-57.37	4.61	-47.00	5.76
12588.000	-51.98	-56.95	4.97	-47.00	4.98

Note:
1. All Reading are peak value.
2. “ ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Correction Factor

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Spurious Emission
Test Site : No.3 OATS
Test Mode : Mode 2: Receiver 54Mbps (Channel 1)

Frequency (MHz)	Measurement (dBm)	Reading (dBm)	Correction Factor (dB)	Limit (dBm)	Margin (dB)
Peak Detector **(Horizontal)**					
400.243	-61.81	-61.00	-0.81	-57.00	4.81
486.370	-65.89	-64.64	-1.26	-57.00	8.89
599.584	-62.52	-60.63	-1.89	-57.00	5.52
670.142	-62.32	-60.11	-2.21	-57.00	5.32
799.218	-65.29	-62.44	-2.85	-57.00	8.29
933.937	-66.11	-62.52	-3.59	-57.00	9.11
2038.000	-66.19	-73.95	7.76	-47.00	19.19
4076.000	-59.62	-68.41	8.79	-47.00	12.62
6114.000	-58.96	-66.98	8.02	-47.00	11.96
8152.000	-53.70	-58.85	5.15	-47.00	6.70
10190.000	-53.03	-57.81	4.78	-47.00	6.03
12228.000	-52.05	-57.06	5.01	-47.00	5.05
Peak Detector **(Vertical)**					
98.203	-67.88	-68.63	0.75	-57.00	10.88
399.642	-69.40	-68.56	-0.84	-57.00	12.40
500.455	-70.48	-69.10	-1.39	-57.00	13.48
535.460	-70.63	-69.09	-1.54	-57.00	13.63
669.817	-64.91	-62.68	-2.23	-57.00	7.91
800.262	-71.93	-69.05	-2.88	-57.00	14.93
2038.000	-67.09	-74.85	7.76	-47.00	20.09
4076.000	-54.08	-62.87	8.79	-47.00	7.08
6114.000	-58.58	-66.60	8.02	-47.00	11.58
8152.000	-54.40	-59.55	5.15	-47.00	7.40
10190.000	-52.84	-57.62	4.78	-47.00	5.84
12228.000	-51.48	-56.49	5.01	-47.00	4.48

Note:
1. All Reading are peak value.
2. “ ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Correction Factor

Product : Wireless 11g + Bluetooth Combo PCI Card
Test Item : Spurious Emission
Test Site : No.3 OATS
Test Mode : Mode 2: Receiver 54Mbps (Channel 13)

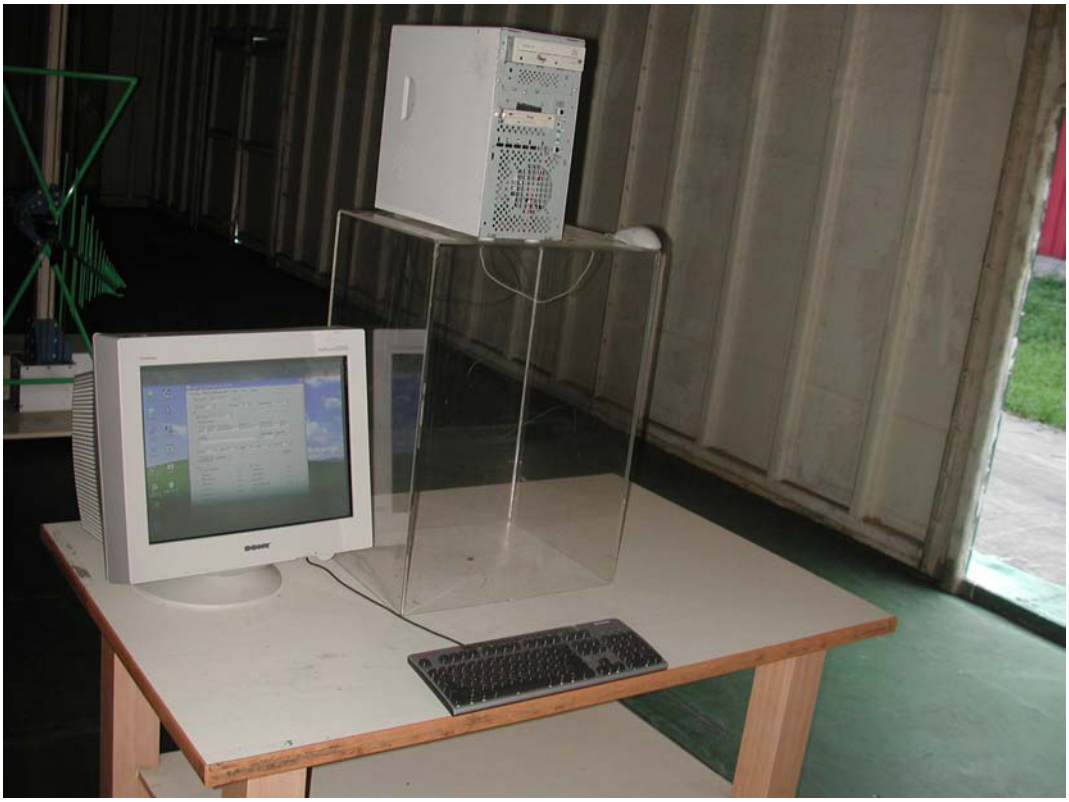
Frequency (MHz)	Measurement (dBm)	Reading (dBm)	Correction Factor (dB)	Limit (dBm)	Margin (dB)
Peak Detector **(Horizontal)**					
400.318	-61.76	-60.90	-0.86	-57.00	4.76
486.148	-65.78	-64.50	-1.28	-57.00	8.78
599.600	-62.55	-60.69	-1.86	-57.00	5.55
669.984	-62.24	-60.07	-2.17	-57.00	5.24
800.131	-65.28	-62.40	-2.88	-57.00	8.28
933.408	-66.04	-62.51	-3.53	-57.00	9.04
2098.000	-66.06	-73.78	7.72	-47.00	19.06
4196.000	-60.50	-69.22	8.72	-47.00	13.50
6294.000	-57.13	-64.74	7.61	-47.00	10.13
8392.000	-52.71	-57.92	5.21	-47.00	5.71
10490.000	-52.83	-57.44	4.61	-47.00	5.83
12588.000	-51.86	-56.83	4.97	-47.00	4.86
Peak Detector **(Vertical)**					
98.058	-67.97	-68.68	0.72	-57.00	10.97
400.384	-69.43	-68.65	-0.78	-57.00	12.43
499.800	-70.40	-69.07	-1.34	-57.00	13.40
536.203	-70.61	-69.12	-1.49	-57.00	13.61
670.035	-64.91	-62.67	-2.24	-57.00	7.91
800.689	-71.88	-69.01	-2.87	-57.00	14.88
2098.000	-49.55	-57.27	7.72	-47.00	2.55
4196.000	-51.12	-59.84	8.72	-47.00	4.12
6294.000	-52.57	-60.18	7.61	-47.00	5.57
8392.000	-53.17	-58.38	5.21	-47.00	6.17
10490.000	-53.30	-57.91	4.61	-47.00	6.30
12588.000	-51.47	-56.44	4.97	-47.00	4.47

Note:
1. All Reading are peak value.
2. “ ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Correction Factor

Attachment 1: EUT Test Photographs

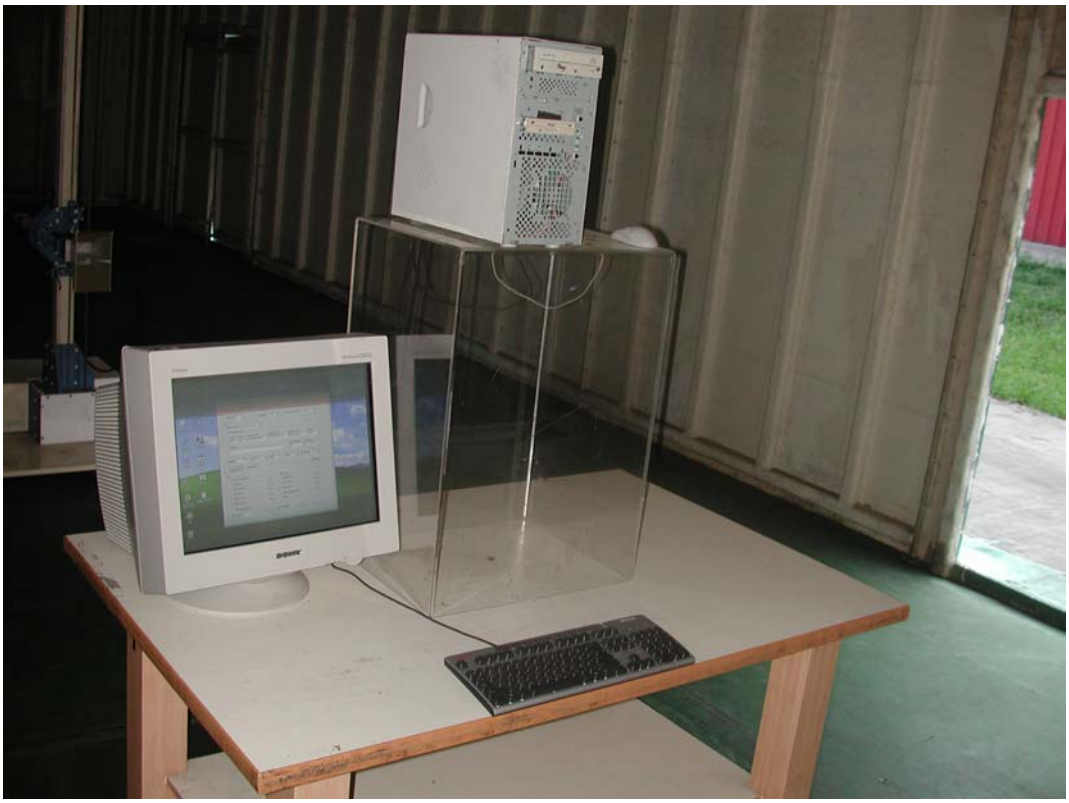
Attachment 1: EUT Test Setup Photographs

Front View of Radiated Test



Back View of Radiated Test

Front View of Radiated Test (Horn)



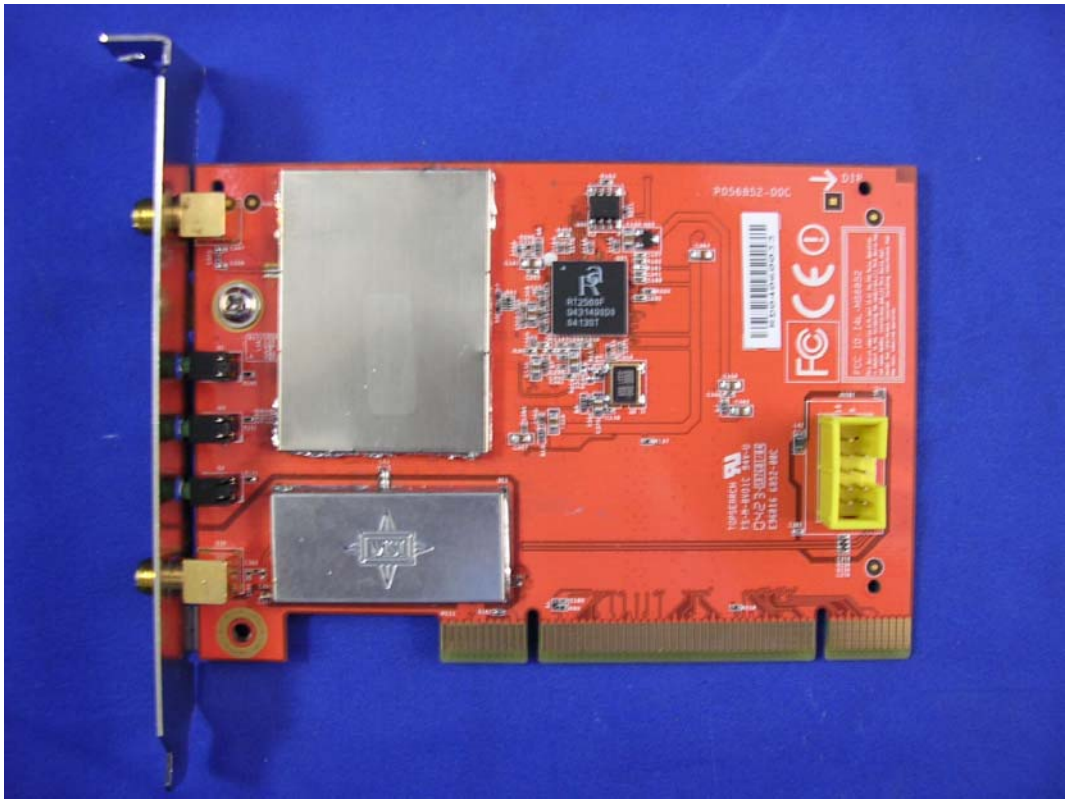
Back View of Radiated Test (Horn)

Attachment 2: EUT Detailed Photographs

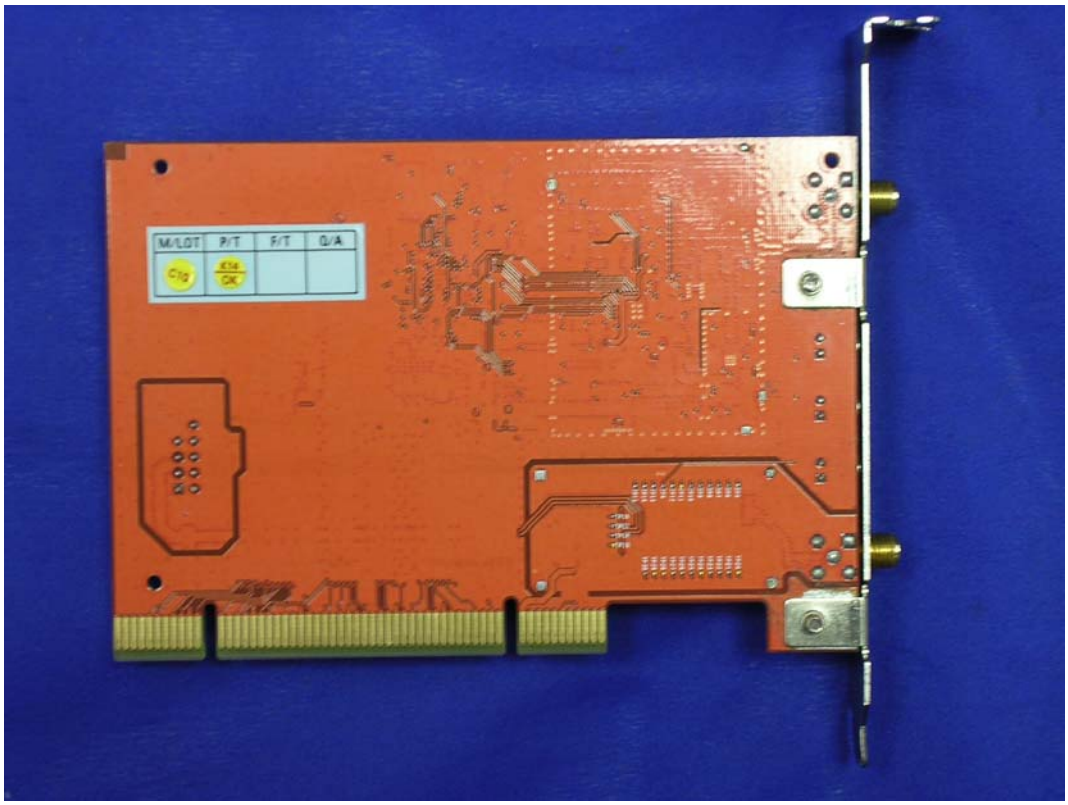
Attachment 2 : EUT Detailed Photographs

(1) EUT Photo

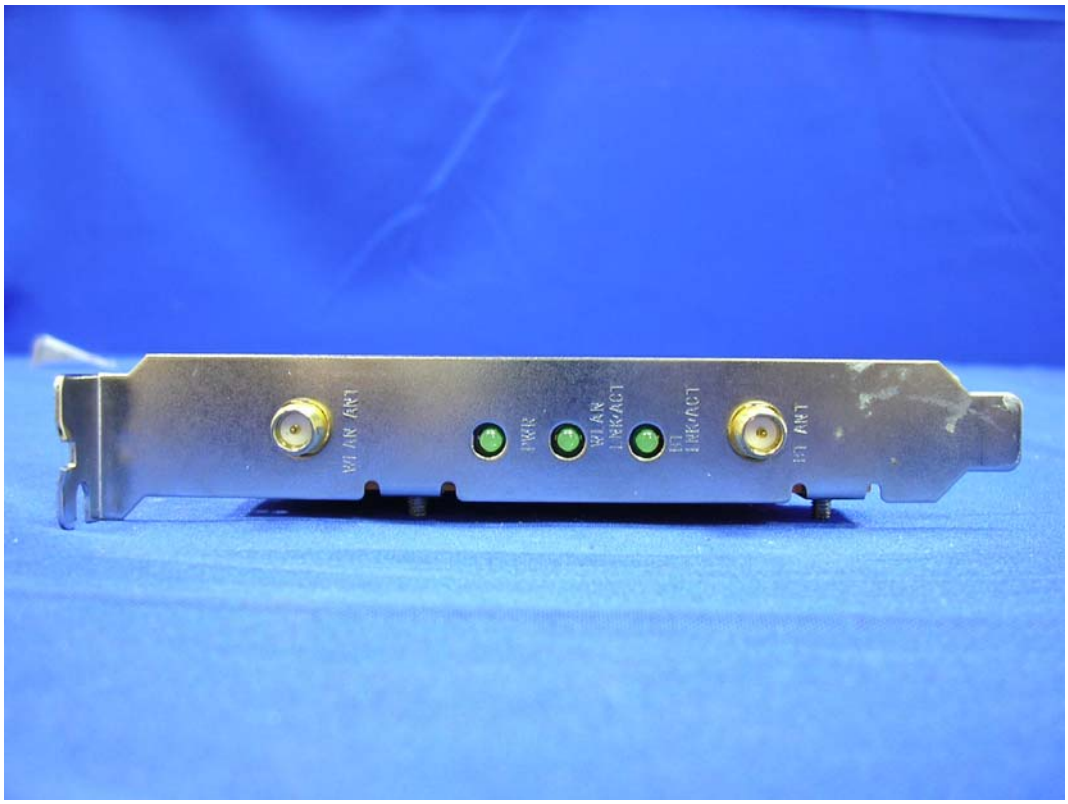
(2) EUT Photo



(3) EUT Photo

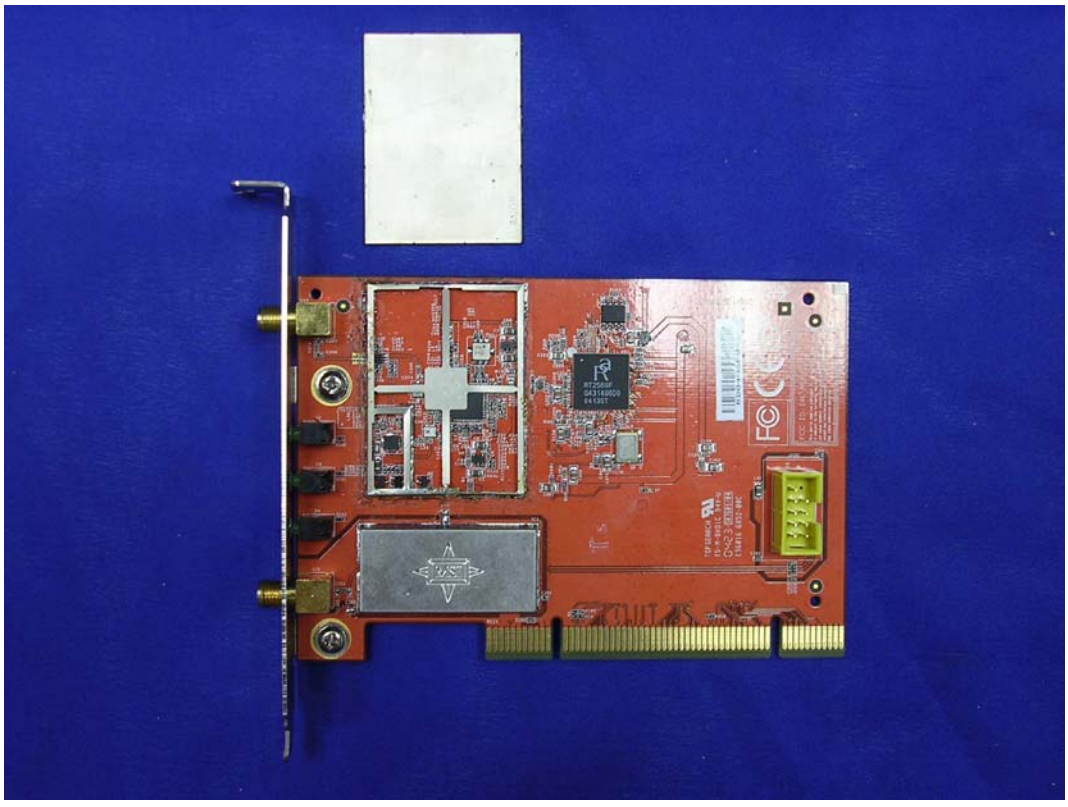


(4) EUT Photo



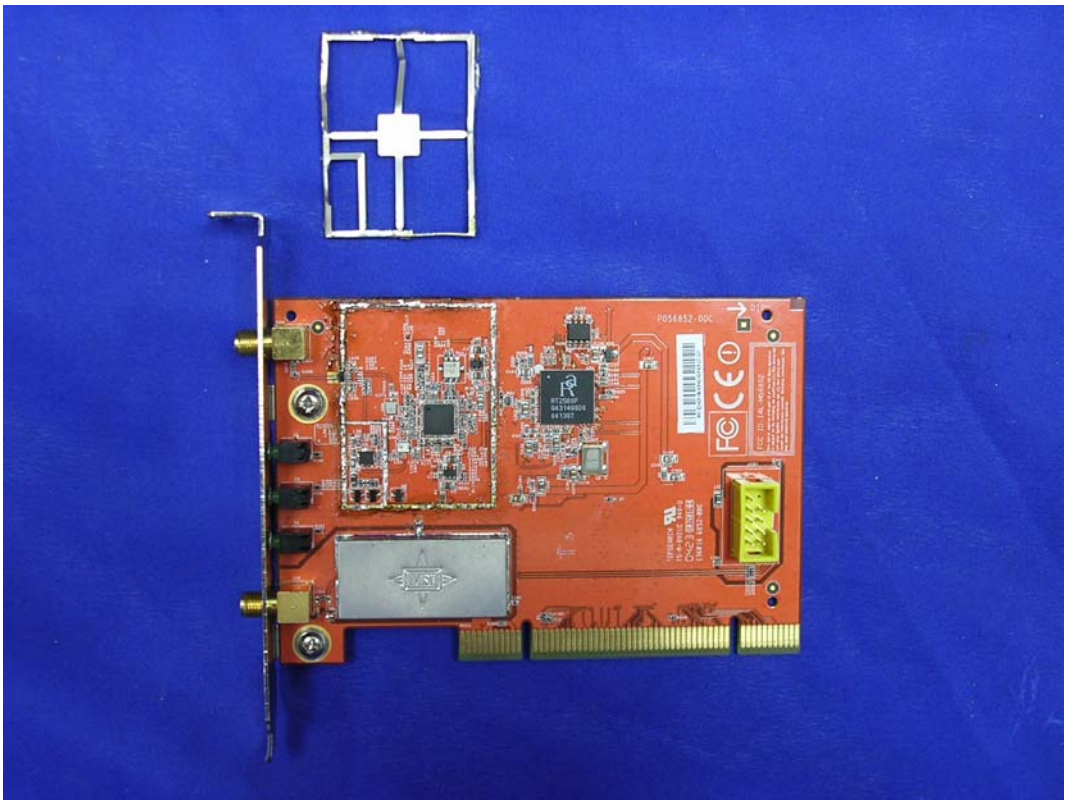
(5) EUT Photo

(6) EUT Photo



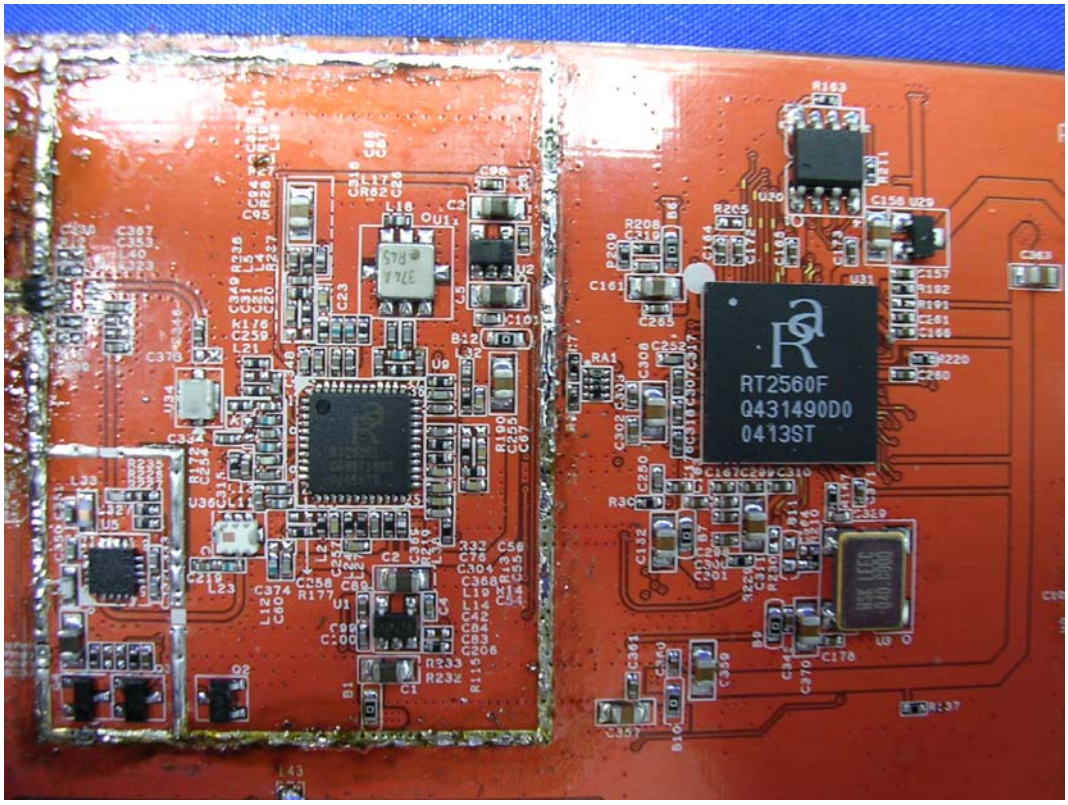
(7) EUT Photo

(8) EUT Photo



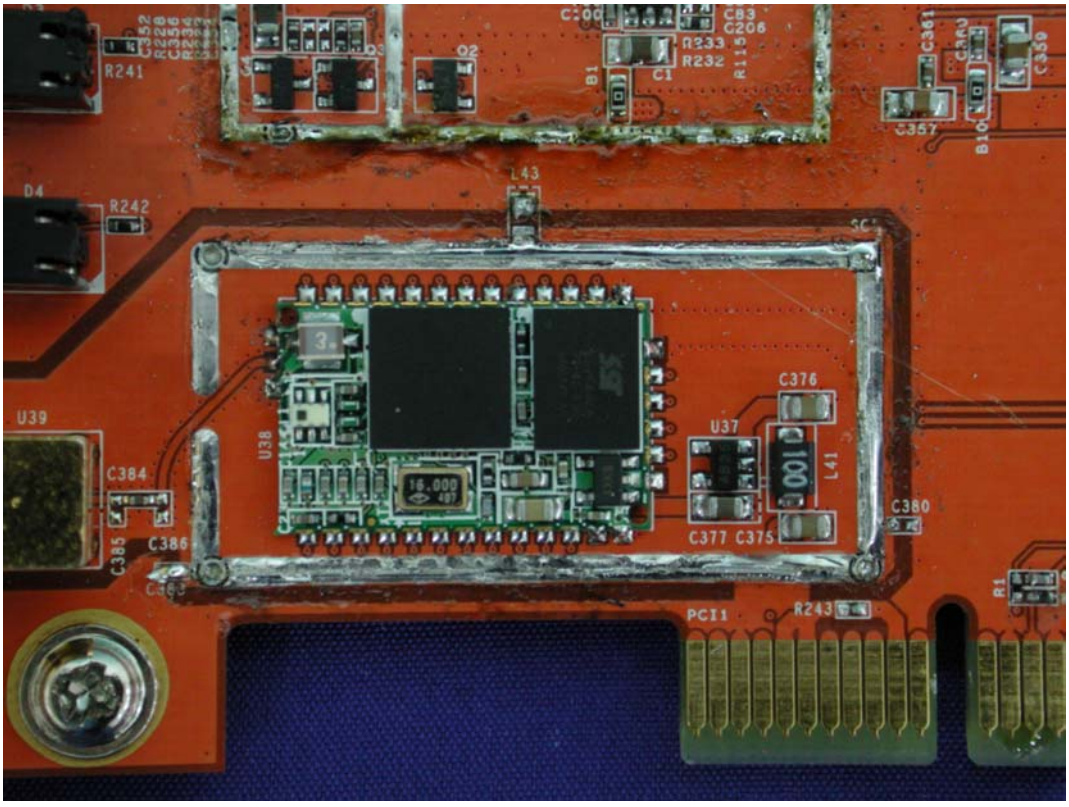
(9) EUT Photo

(10) EUT Photo



(11) EUT Photo

(12) EUT Photo



(13) EUT Photo

(14) EUT Photo